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Further information at <http://www.bryozoa.net/iba/index.html>

## News from the Membership

**Javier Souto.** In the framework of the project financed by the FWF- Austria to study the bryozoans from Iberian Atlantic seamounts, I have been working in the Senckenberg am Meer in Wilhelmshaven and in the Estrutura de Missao para a Extensao da Plataforma Continental (EMEPC) in Lisbon. With the help and hospitality of Dr. André Freiwald and Kei Matsuyama (photo), I spent three weeks in Germany sorted and studied samples from the Galicia Bank and Gorringe, collected during the campaign carried out in 1997 on board of the Victor Hensen Ship.

In Lisbon I had the opportunity to study, during two weeks samples collected from the LUSO and EMEPC campaigns, carried out in the Gorringe between 2006 and 2009. I hope that the work with these samples give soon interesting results to know the diversity of bryozoans and the ecology of these seamounts.



*André Freiwald, Javier Souto and Kei Matsuyama, in the entrance of the institute.*

**Paul Taylor and Consuelo Sendino.** The NHM bryozoan twitter feed (@BryozoanNHM) is increasing in popularity and now has more than 300 followers. Consuelo Sendino and I are currently (April and May) running a daily tweet of images under the theme 'baby on board' showing bryozoan brood chambers.

**Emanuela Di Martino.** Emanuela successfully defended her doctorate in Utrecht during February. Her thesis, entitled 'Cenozoic bryozoans from Borneo', was the first to be completed by a cohort of students working on the EU Marie Curie 'Throughflow' project studying the geological origin of high marine diversity in the Indo-Pacific (sent in by Paul Taylor)

**Amalia Herrera.** I'm currently working in the curation and cataloging of the collection of cheilostomes bryozoans from the Eastern Pacific of Panama, thanks to a grant obtained from SENACYT (Secretaria Nacional de Ciencia y Tecnologia). The aim is to build a data base of the species, with digital images, collection data and bibliography; and publish it as a scientific article in a journal of taxonomy in the modality 'open access'. The comparison of this information with data bases such as NMITA will help to evaluate the degree of impact of the closure of the isthmus of Panama in the changes of distribution and diversification of bryozoa fauna in the last 25 million years. And to estimate adequately the range of distribution of the so called invasive species in ports areas of the Eastern Pacific, and how much of their historical biogeography have been altered by the contemporary world trade.

**Hans Arne Nakrem.** The PDF file archive is gathering data and links, however what is NOT working out so good is the Oslo database server. I have had un-understandable problems; at longer times the database is completely "down" - but at other times "up" and very fast. I am working on this, but as the situation is now, its existence cannot be advertised..... In the meantime I continue entering data into the database and "find" scanned literature, so when the technical situation is good, I can easily publish the database.

**Thomas Schwaha.** Due to drastic events in my family the past months, I had to neglect several of my responsibilities here and got me stuck to the bare necessities or things that were already set in motion. Consequently I had to neglect the IBA website lately. I'm sorry for any inconvenience and delays. I'll get back to it ASAP.

I have got two more things to mention:

1. I visited Masato Hirose in April for collecting freshwater bryozoans of Japan. We were quite successful and thanks to Masato I had a very pleasant stay in Japan. Say Hello to a *Stephanella hina* colony:



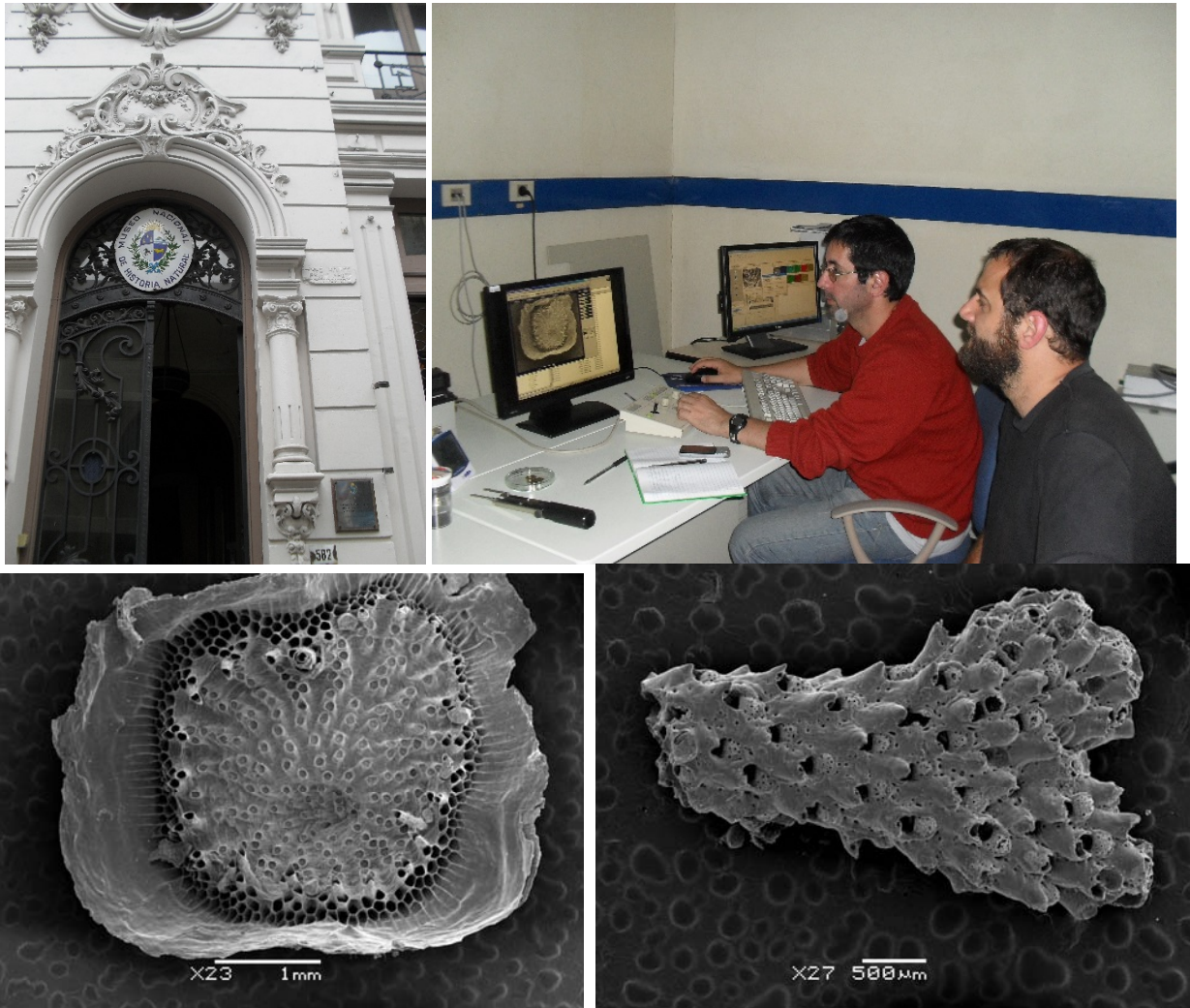
2. Last conference I mentioned to organize a workshop for newcomers in morphological methods such as different microscopy imaging techniques as well as histological procedures and sectioning methods. So I would like to announce the 1st Jean-Loup d'Hondt workshop in Vienna from 12th-14th September. It's of course named after Jean-Loup d'Hondt and his contributions in bryozoan morphology. Since I'm limited in lab space and the microtome, there will be a limit of 10-12 attendants. Some already mentioned that they want to participate, but to make sure I don't forget anyone interested, please contact me till the end of June. I will provide some more information in the course of May.



**Lais V. Ramalho:** I just to move again to Rio de Janeiro State (São Pedro da Aldeia city far 130 km from Rio de Janeiro city), where my husband assumed a new position (Vice-Director) of a Research Marine Institute of the Brazilian Navy (IEAPM – Instituto de Estudos do Mar Almirante Paulo Moreira). We stay here for more 2-3 years, so if you come here to Brazil and/or you have interesting to know this Institute, please let me know about that.

Despite of I am living in Rio, I am continuing working with Bryozoans from the South of Brazil (Pleistocene and Recent) together with Federal University of Rio Grande – FURG and National Museum (Rio de Janeiro) and with Miocene Bryozoans from Pirabas Formation (Pará State, Northern Brazil with Dr. Vladimir Távora, UFPA and Dr. Kamil Zagorsek, Narodni Museum).

*Bryozoans from Uruguay:* expanding a little bit the studies about Bryozoans from South Brazil I had the opportunity to make a short visit to Montevideo, Uruguay, where I worked with the researchers Fabrizio Scarabino and Alejandro Márquez at the National Agency of Aquatic Resources (DINARA), National Museum of Natural History (MNHNM) and University (UdelaR). In the latter, I also meet Prof. Alejandra Rojas, who is working with Quaternary shelly faunas.



*Museo Nacional de Historia Natural, Montevideo (above, left). Alejandro Márquez and Fabrizio during SEM work (above, right). Photographed species: Cyclostomata (below and left) and Turbicellepora (below and right).*

We analysed and curated 173 samples from shallow and deep waters where we found many colonies on natural and artificial substrates, totalizing 43 taxa. These samples have been collected during several years through joint efforts of MNHNM and DINARA covering wide parts of the Uruguayan coastline and shelf. This zone is biogeographically very interesting (northern and southern distribution of many benthic species) but its bryozoofauna is very poorly reported.

Preliminary comparisons show that the fauna from Uruguay, at least in the inner shelf, is very similar to that from South Brazil. Next step is identify all specimens and make some biogeographic analyses together with Dr. Juan Lopez Gappa (Museo Argentino de Ciencias Naturales), including species from Argentina. We hope to publish the results of this work as soon as possible.



Above: Samples room and I working there. Below: examples of samples analysed (*Cellaria* sp, left and *Conopeum reticulum*, right).





# A brief report on the WABO expedition to the Wanganui Basin, New Zealand.

Seabourne Rust

One day in January 2014, blown black sand and white foam raced along the exposed Castlecliff coast, as the WABO ('Wanganui Bryozoan project in Oslo') team struggled against the strong westerly wind. The team consisted of leader Lee Hsiang Liow and Kjetil Voje (University of Oslo), Paul Taylor (NHM) and myself, New Zealand guide Seabourne Rust (I did my PhD study in this area). In the coastal cliffs above lay our goal, a series of bryozoan-rich Pleistocene Shellbeds, in strata spanning the last 2 Ma. To get to the outcrops we would have to climb the dunes and battle our way through dense vegetation up the steep slopes above the beach. We were rewarded with fine views up and down the coast, an area we would become familiar with over the coming ten days.

The Wanganui Basin is situated on the southwestern part of New Zealand's North Island. Cyclothem Plio-Pleistocene sequences here contain a record of shallow marine molluscs and bryozoan faunas (Rust and Gordon, 2011). The WABO project aimed to systematically sample shell-encrusting cheilostome bryozoans and infer occupancy, abundance, diversity and competitive interactions between taxa through space and time. Providing useful data from such material required a large number of samples from laterally extensive horizons with well-constrained ages.

Alan Beu and others at GNS Science (Lower Hutt, NZ) provided logistical support and inside geological knowledge. From a base in Wanganui township, the team made numerous day excursions across the Wanganui Basin area, concentrating on the well-known and best exposed coastal outcrops. Highlights included four-wheel driving along Castlecliff Beach at low tide; richly fossiliferous Nukumarū Limestone at Waiinu (when the wind died down enough to open your eyes!); too many cyclostome bryozoans to mention; stunning scenery after a bumpy off-road track to the wild and isolated Nukumarū Beach, trips up the Wanganui River Valley and up the coast to Waipipi. Other memorable moments included some long evenings wrapping thousands of fossils; Paul's tweeting\*; pockets, hair and eyes full of sand, and, besides the obligatory coffee and chocolate, a gastronomic survey of Wanganui eating establishments from Asian restaurants, kiwi-style fish'n'chips, to the local berry farm.

We were fortunate to be joined by Dennis Gordon (NIWA) and family in the field for several days, who provided expertise on local bryozoan taxonomy and enjoyable company! Dennis also kindly hosted a visit to NIWA lab in Wellington to look at some contemporaneous bryozoans from the modern day Wanganui Shelf. Later in the field we were also joined by fellow Norwegian biologist cameraman Tore Elgvin who documented aspects of the fieldwork.



WABO team, left to right: S. Rust, K. Voje, L. Hsiang-Liow, P. Taylor, D. Gordon.

Overall the trip was a lot of hard work but very enjoyable. A large number of samples were collected and have been sent to Oslo for preparation and detailed analysis by Lee, Kjetil and co-workers at the Centre for Ecological and Evolutionary Synthesis. Stay tuned for future results...Upon completion of fieldwork in New Zealand the team were 'rewarded' with the experience of feeling an earthquake (6.2 magn.)!



*Studying and sampling the Tainui Shellbed.*



*Richly fossiliferous Nukumarū Limestone.*

Rust, S. and Gordon, D. (2011) Plio-Pleistocene Bryozoan faunas of the Wanganui Basin, New Zealand: stratigraphic distribution and diversity, *New Zealand Journal of Geology and Geophysics* 54 (2): 151-165.

\* for some great photos of our bryozoans and more see <https://twitter.com/BryozoanNhm>

*Seabourne Rust (on behalf of WABO).*



**Painting of Castlecliff, Wanganui, New Zealand by Seabourne Rust  
commemorating the WABO fieldwork, Jan. 2014  
commissioned by Lee Hsiang Liow**





# Late Pleistocene mammalian bones as substrates for encrusting Recent bryozoans, Brown Bank, North Sea

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There have been few reported occurrences of episkeletozoan bryozoans attached to reptile or mammalian bones. From the United States, Hay (1923) noted bryozoans on bones of the Giant Ground Sloth *Eremotherium mirabile* (Leidy, 1852) collected just over one hundred years earlier by Joseph Clay Habersham and J.P. Scriven from the Pleistocene of Skidaway Island, Georgia. These are now in the Smithsonian Institution (see for example specimens V826 -V831, <http://collections.si.edu/search/results.htm?view=&sort=&date.slider=&q=Megatherium+mirabile> - accessed 7/1/2014). Burns (1991, p. 157) reported finding a horse tooth from the Miocene of Virginia, and Hulbert et al. (1998) recorded a Eocene cetacean from Georgia, both of which had been encrusted by unidentified Bryozoa. Kues (1983) reported on the discovery of what was tentatively identified as *Conopeum* attached to a ceratopsian dinosaur skull from the Upper Cretaceous Fruitland Formation of New Mexico. This latter example was considered to have lived in a non-marine low salinity environment (Kues 1983, p. 53).

During last summer one of the authors (KS) purchased a number of Pleistocene bones in a village shop on the island of Texel, the Netherlands. These bones comprised a leg bone of an unidentified *Equus* (horse) species (Figure 1A), and a fractured *Bison* bone (Figure 1D). Close examination of the bones revealed the presence of a number of small encrusting bryozoan colonies (Figure 1A-C) (see discussion below). This short note is primarily aimed at drawing the attention of bryozoologists to this hard substrate as a source of bryozoans for potential further study.

During fishing using trawl nets, the Brown Bank (or Brown Ridge) off the Hook of Holland in the North Sea continues to yield large quantities of bones and antlers of various large Late Pleistocene mammals including *Coelodonta* (Woolly Rhinoceros), *Mammuthus* (Woolly Mammoth), *Rangifer* (Reindeer), *Bison* (Bison), *Bos* (Auroch), *Megaloceras* (Giant Irish Deer), *Cervus* (Red Deer) and *Equus* (Horse) (see van Kolfschoten & Laban 1995; Mol et al. 2006 and references therein), while a rare example of a Sabre-Toothed Cat (*Homotherium*) was recovered in an area just southeast of the bank (Reumer et al., 2003). A number of bones and antlers have been fashioned into implements (Louew Kooijmans 1970-71). In an area just southeast of the Brown Bank The Brown Bank was, like the Dogger Bank further west in the south North Sea, exposed as recently as 9,000 years ago, although dating Reindeer bones recovered from the North Sea has revealed that there has been considerable mixing of materials from between c. 33,000 to 45,000 years BP (Mol et al. 2006, p. 179; van Kolfschoten et al. 2011, p. 10). The bones are largely recovered from depths of between 25 and 45 m from the bank itself or up to 50 m from gullies to its west (Louew Kooijmans 1970-71). Following collection and conservation many isolated bones, as well as skeleton whole-mounts are available for sale (see <http://www.northseafossils.com> - accessed 6/1/2014).

Although these mammalian fossils have been studied for some considerable time since the mid-1800s (see Mol et al. 2006), there appear to be only three previous published reports of encrusting bryozoans on the many bones recovered. Louew Kooijmans (1970-71, p. 35) notes that "The bones were incrustated to different degrees with recent Bryozoa, which indicates that they had already been washed free for varying lengths of time"; Bosscha Erdbrink (1982, p. 5) noted some bryozoan colonies on a Brown Bear mandible; while van Kolfschoten and Laban (1995, p. 136) simply note that bones lying on the seabed are encrusted by bryozoans. In 2008 a sabre-toothed cat humerus was recovered and an online article mentioned that it was encrusted with bryozoans (<http://news.bbc.co.uk/2/hi/sci/tech/7735544.stm> - accessed 6/1/2014). None of these reports provided identifications of bryozoan taxa.

*Equus* bone: Two Recent bryozoan taxa *Conopeum reticulum* (L., 1767) (4 colonies) (Figure 1B) and *Aspidelectra melolontha* (Lansborough, 1852) (5 colonies) (Figure 1C) present; *C. reticulum* colonies are concentrated at either end of the bone (Figure 1A). Mild abrasion of the bone through rolling on the seabed has removed portions of colonies.

*Bison* bone: Moderately densely encrusted in places by *Balanus* (barnacles) and various tube worms, but bryozoan colonies are rare with only three colonies in total of *Conopeum reticulum* (1 colony) and *Aspidelectra melolontha* (2 colonies). Barnacles (or their basal attachments scars) are reasonably conspicuous episkeletozoans on mammalian and reptilian bones of various ages as far back as the Jurassic (see listing in Boessenecker 2013, Table 1).

Both epibionts have a north-eastern Atlantic distribution, and are frequently found in close association (Hayward and Ryland 1998, p. 138), and often (or typically in the case of *A. melolontha*) in brackish water. This suggests that encrustation of the Pleistocene bones may have taken place at some point in the not-so-distant past when sea level in the area was lower than at present and in estuarine environments that drained the lateral margins of the Brown Bank.

Although this note is based on a tiny sample of two bones examined, trawled material from the Brown Bank and elsewhere from the North Sea is plentiful, and there is potential for sedimentological, taphonomic, biogeographical and taxonomic studies of modern bryozoans of the North Sea that occur episkeletally on this unusual fossil substrate.

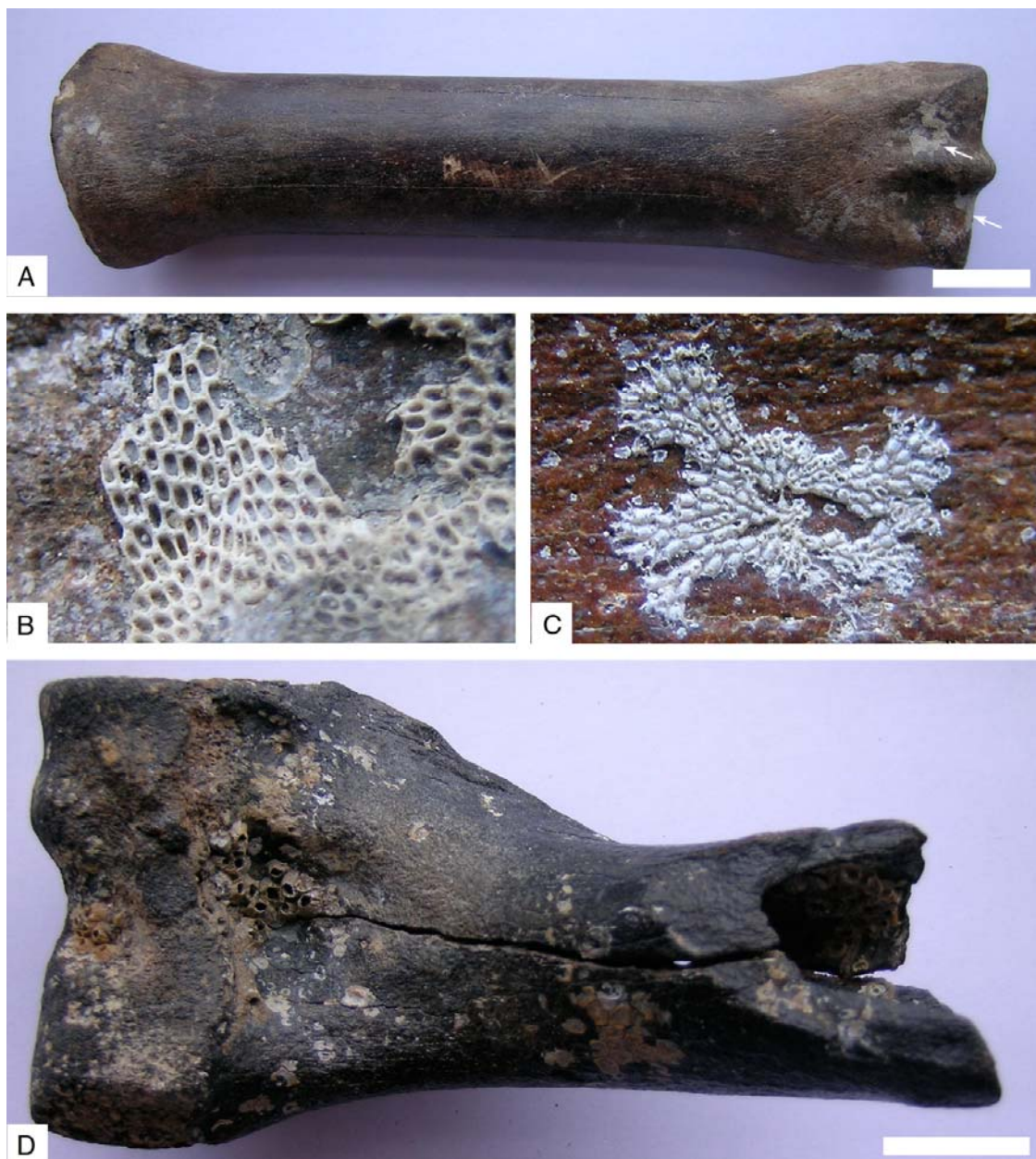


Figure 1. A. *Equus* bone with encrusting bryozoan colonies (arrowed); B. *Conopeum reticulum* on *Equus* bone; C. *Aspidelectra melolontha* on *Equus* bone; D. Portion of *Bison* bone with clusters of encrusting *Balanus* (barnacles). Scale bars = 25 mm.



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# Transfer of Wreford Bryozoan Collections

**Roger J. Cuffey**

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Long held in the Paleobryozoological Research Collection at Pennsylvania State University (PBRC PSU), the bryozoan collections from the Wreford Megacyclothem (Lower Permian; Kansas, Oklahoma, and Nebraska) have been transferred to the University of Kansas Natural History Museum for long-term safe-keeping. Contact their collections manager, Dr. Una C. Farrell ([ufarrell@ku.edu](mailto:ufarrell@ku.edu)) or curator-in-charge, Dr. Bruce S. Lieberman ([blieber@ku.edu](mailto:blieber@ku.edu)) for access to these specimens.

The following is a complete list of publications in which various of these materials have been illustrated. This list is provided here because such papers have appeared over many years and in a variety of sources, and so may not be readily compiled otherwise:

- Bartley, J.W. & Anstey, R.L. 1987. Growth of monilae in the Permian trepostome *Tabulipora carbonaria*: Evidence for periodicity and a new model of stenolaemate wall calcification. In Ross, J.R.P. (ed.), *Bryozoa: Present and Past*. Western Washington University, Bellingham; p. 9-16.
- Cuffey, R.J. 1967. Bryozoan *Tabulipora carbonaria* in Wreford Megacyclothem (Lower Permian) of Kansas. *University of Kansas Paleontological Contributions, Article 43 (Bryozoa Article 1)*, p. 1-96.
- Cuffey, R.J. 1979. Identification Manual for Wreford Bryozoan Species. Unpublished booklet, Pennsylvania State University, University Park / State College; p. 1-55.
- Cuffey, R.J. 1999. Teaching evolution within an advanced-undergraduate paleontology course. *Paleontological Society Papers*, v. 5 (The Evolution-Creation Controversy II: Perspectives on Science, Religion, and Geological Education), p. 207-216 (p. 210, 212, 213 = Wreford *Tabulipora* evolutionary lineage).
- Cuffey, R.J. & Hall, W.B. 1985. Species-level bryozoan assemblages within the Lower Permian Wreford Megacyclothem of Kansas, Oklahoma, and Nebraska. *Congrès International de Stratigraphie et Géologie du Carbonifère (9e, Urbana) Compte Rendu*, v. 5, p. 256-260.
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- Lutz-Garihan, A.B. 1976. *Composita subtilita* (Brachiopoda) in the Wreford Megacyclothem (Lower Permian) in Nebraska, Kansas, and Oklahoma. *University of Kansas Paleontological Contributions, Paper 81*, p. 1-19.
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- Pachut, J.F., Cuffey, R.J., & Anstey, R.L. 1991. The concepts of astogeny and ontogeny in stenolaemate bryozoans, and their illustration in colonies of *Tabulipora carbonaria* from the Lower Permian of Kansas. *Journal of Paleontology*, v. 65, p. 213-233.
- Schultze, H.-P. 1985. Marine to onshore vertebrates in the Lower Permian of Kansas and their paleoenvironmental implications. *University of Kansas Paleontological Contributions, Paper 113*, p. 1-18.
- Simonsen, A.H., & Cuffey, R.J. 1980. Fenestrate, pinnate, and ctenostome bryozoans and associated barnacle borings in the Wreford Megacyclothem (Lower Permian) of Kansas, Oklahoma, and Nebraska. *University of Kansas Paleontological Contributions, Paper 101*, p. 1-38.
- Warner, D.J. & Cuffey, R.J. 1973. *Fistuliporacean* bryozoans of the Wreford Megacyclothem (Lower Permian) of Kansas. *University of Kansas Paleontological Contributions, Paper 65*, p. 1-24.



In addition, some of the above were preceded by short notes or abstracts which do not contain any illustrations:

- Bifano, F.V., Guber, A.L., & Cuffey, R.J. 1974. Ostracode paleoecology in shales of the Wreford Megacyclothem (Lower Permian; Kansas and Oklahoma). Geological Society of America Abstracts with Programs, v. 6, p. 492; also Oklahoma Geology Notes, v. 34, p. 124.
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## The Florida Geological Survey Micropaleontology Collection

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The Florida Geological Survey Micropaleontology Collection was transferred to the Florida Museum of Natural History several years ago. Since then we have received an NSF-sponsored grant to curate all the material contained in that collection. Amongst the material we curated are the type and figured specimens from Dr. Cheetham's 1963 paper entitled "Late Eocene Zoogeography of the Eastern Gulf Coast Region". After curating the FGS bryozoan slide collection we are missing 4 holotypes and 3 figured specimens. It was suggested that those specimens might be on loan to a bryozoan worker, however the FGS discarded loan documentation many years prior to transferring the material to us. Can the Bryozoan community to help locate the missing material?

*Tetraplaria obesa* (Holotype)

*Tetraplaria petila* (Holotype)

*Steginoporella hexagonalis* (Holotype)

*Thalamoporella ocalana* (Holotype)

*Steginoporella incrustans* (Figured)

*Steginoporella jacksonica* (Figured)

*Tetraplaria tuberculata* (Figured)

Sincerely,

Roger

## Bryozoans in the News

### The news of the IBA post-conference fieldtrip given by a local newspaper

Antonietta Rosso and Giampietro Braga

An article has been published on the local newspaper "Monte di Malo Oggi" ("Monte di Malo Today") from the Veneto Region, focusing on the visit of the IBA members participating in the post-conference fieldtrip to the Priabona Paleontological Museum. This museum has been created and is currently looked after by the amateurs of the association "Amici del Museo di Priabona" ("friends of the Priabona Museum").

This newspaper article focuses on the brief presentation and visit of the museum and nearby Priabona fossiliferous layers from where bryozoans were first described early in the history of bryozoology by Reuss in 1848. Photos document two main moments of this special day. The first picture (Fig. 1) shows Giampietro Braga (in the centre), flanked by the Major of the village of Monte di Malo, Mr Costante Pretto (on the left), and the President of the "Centro Studi del Priaboniano" ("Centre for the Study of the Priabonian"), on the right, while he describes the Priabonian Stratotype outcrops with the help of an English-speaking person, the Scottish Mrs Elizabeth Dalla Vecchia.



*Da sin.: Il Sindaco di Monte di Malo Dott. Costante Pretto, il Prof. Giampietro Braga - Padova, la Sig.ra Elizabeth dalla Vecchia (interprete scozzese), il presidente del Centro Studi del Priaboniano Dott. Dario Meneguzzo.*



In the second photo (Fig. 2) the group of IBA members (you can recognise, from the left to the right and from the top, Hans Arne Nakrem, Rolf Schmidt, Laís Ramallo, Kamil Zagorsek, Emmy Wöss, Antonietta Rosso and Roger Cuffey) is surrounded by local palaeontology amateurs among which the founder and the soul of the group, the school teacher Renato Gasparella (the third person from the right).



This photo documents the visit to the “Buso della Rana”, a karstic cave eroded into rocks rich in fossils. Washed small remains, among which teeth, can be found in sediments deposited in pockets of the cave floor. The visit, made in the sunny afternoon, after a delicious lunch offered by the Priabona friends, was very pleasant owing to the cool air at the entrance of, and inside the cave.

The Italian text sounds as follows:

“The museum of Priabona fossils call”

The Friends of the Priabona Museum at the entrance of the Buso della Rana

A meeting of scholars, organised by the University of Catania, took place in June 2013 at Priabona. The academics were looking for Bryozoans, small marine fossils allowing the features of environments of millions of years ago to be reconstructed. There were experts coming from several European and extra-European nations.

GiamPietro e Antonietta





Der Fund der Wissenschaftler unter dem Elektronenmikroskop betrachtet: die bizarre Mikrometer-Welt der Seeberg-Bryozoen.

Foto: Javier Souto-Derungs

## Leben auf Gipfeln unter dem Atlantik

Österreichische Wissenschaftler fanden auf Seebergen unter der Atlantikoberfläche zahlreiches Getier. Kleine schwarze Haie, eine neue Krebsart und Moostierchen. Diese Spezies lebt in Verbänden und baut so größere Strukturen mit Arbeitsteilung auf.

Kurt de Swaaf

Wien – August 2011: Nordwestlich der spanischen Hafenstadt Vigo fährt das Forschungsschiff Miguel Oliver über das ziemlich stürmische Meer. Es ist auf dem Weg zur etwa 200 Kilometer von der Küste entfernt liegenden Galicien Bank, einem ausgedehnten unterseeischen Plateau mit einer Fläche von über 6200 Quadratkilometern. „Das Wetter war nicht wirklich gut“, berichtet der an der Universität Wien tätige Meeresbiologe Javier Souto-Derungs im Gespräch mit dem STANDARD. Fünf bis sechs Meter hohe Wellen sorgten für eine turbulente Fahrt. Die Wissenschaftler an Bord störte das allerdings nur wenig. Ihr Ziel war es, mehr über das Leben dort draußen in der Tiefe zu erfahren. Eine spannende Entdeckungsreise.

Die Galicien Bank ist ein sogenannter Seeberg. Das Unterwassermassiv erhebt sich mehr als 4000 Meter über dem Tiefseeboden des Atlantiks, der höchste Punkt liegt etwa 600 Meter unter der Ozeanoberfläche. Es gibt keine Verbindung mit den Flachwasserbereichen an der Küste der Iberischen Halbinsel, dazwischen liegt ein rund 3500 Meter tiefer Graben. „Ein Seeberg ist wie eine

Insel“, meint Javier Souto-Derungs. Und wie viele Inseln haben auch die unterseeischen Gebirge oft ihre eigenen, typischen Lebensgemeinschaften. Deren Struktur und Ökologie sind gleichwohl nur ansatzweise erforscht. Viele Experten glauben, dass Seeberge aufgrund ihrer isolierten Lage eine überdurchschnittlich hohe Anzahl an Endemiten, Tier- und Pflanzenspezies, die nur an einem bestimmten Ort vorkommen, beherbergen müssten. Doch wirklich bewiesen ist das nicht.

### Arbeit mit Sonden

Souto-Derungs und seine Kollegen wollten die Artenvielfalt der Galicien Bank genauer erfassen. Mit Schleppnetzen, Dredschern und Sonden suchten sie Boden und Hänge des Plateaus ab. Eine Tauchkamera machte Unterwasserfotos.

Der Einsatz wurde belohnt. Die Geräte brachten körbewise Getier an Bord, auch das Bildmaterial lieferte wertvolle Informationen. Das Gebirge ist offenbar an vielen Stellen von Kaltwasser-Korallen besiedelt. Andersorts steht praktisch nackter Fels an, während flache Bodenpartien vor allem mit winzigen Schneckengehäusen bedeckt sind.

Zu den vorgefundenen Bewohnern gehören unter anderem kleine schwarze Haie und eine neu entdeckte Krebsart, *Uropytychus cartesi*. Letztere hat Verwandte in der Karibik.

Das Hauptinteresse von Javier Souto-Derungs gilt indes den Bryozoen, zu Deutsch Moostierchen. Über sie hofft der Forscher mehr Einblick in die Entstehung der Fauna von Seebergen und den dort herrschenden ökologischen Bedingungen zu bekommen. Moostierchen sind eigentümliche Kreaturen. Ähnlich wie Korallenpolypen leben sie in Verbänden zusammen und bauen dabei gemeinsam größere Strukturen auf. Diverse Arten bilden krustenartige Kolonien, andere filigran verzweigte oder scheibenförmige Konstruktionen. Die oft weniger als einen Millimeter großen Tiere haben Gehäuse aus Proteinfasern. Häufig sorgt eingelagerter Kalk für zusätzliche Festigkeit. Die Winzlinge ernähren sich von organischen Partikeln und Einzellern, welche sie mit ihren Tentakeln aus dem Wasser filtern.

Bei vielen Bryozoen-Spezies tritt innerhalb eines Verbandes Arbeitsteilung auf. Während sich zahlreiche kleinere Individuen um die Nahrungsversorgung kümmern, sind einige stärkere Kolonienmitglieder mit der Produktion von Eizellen und Spermien beschäftigt.

Die seltsam aussehenden Avicularien wiederum sorgen mit ihren schnabelartigen Haken und den damit verbundenen Muskeln für die Verteidigung oder die Ver-

ankerung der Gemeinschaft. Sämtliche Einzeltiere stehen über Gebeigänge miteinander in Verbindung. So können auch Nährstoffe ausgetauscht werden. Die Fortpflanzung erfolgt bei Bryozoen über frei ins Wasser abgegebene Spermien. Sie treffen so auf die reifen Eizellen benachbarter Artgenossen und befruchten diese. Relativ viele Arten betreiben Brutpflege. Die befruchteten Eier entwickeln sich dann im Körper des – oft zwittrigen – Muttertieres. Frisch geschlüpfte Larven sind zwar schwimmfähig, aber sie müssen sich normalerweise schon nach kurzer Zeit auf festem Untergrund niederlassen.

### Unselbstständiger Nachwuchs

Was dahintersteckt: Anders als bei vielen anderen Meerestierchen lebt der Nachwuchs der allermeisten Moostierchen-Spezies nicht selbstständig im Plankton. Sie können nicht für ihr eigenes Futter aufkommen und zehren stattdessen von einer Dotterreserve. Ist diese aufgebraucht, muss die junge Bryozoe schleunigst sesshaft werden und mit der Metamorphose beginnen. Weite Reisen in der Meeresströmung sind deshalb ausgeschlossen. Die Kleinen können nicht allzu fern von ihrer Elternkolonie Fuß fassen.

Ihre mangelnde Mobilität macht Moostierchen zu interessanten Indikator-Organismen. Sie müssen sich stark an ihre Umwelt anpassen, was dazu führen könnte, dass in isolierten Lagen mit der Zeit neue, spezialisierte Arten entstehen. Javier Souto-Derungs

vergleicht deshalb die auf der Galicien-Bank eingesammelten Bryozoen mit solchen, die vom nahe gelegenen Kontinentalschelf und zwei weiteren Seebergen, der *Le Danois* Bank in der südöstlichen Biscaya und der *Gorringa* Bank westlich der Algarve, stammen.

Der Experte verwendet für seine Untersuchungen zu einem wesentlichen Teil elektronenmikroskopische Aufnahmen. Nur so lassen sich die unterschiedlichen Arten eindeutig identifizieren. Das hinzugezogene Vergleichsmaterial wird hauptsächlich vom Oberösterreichischen Landesmuseum in Linz bereitgestellt. Dort befindet sich eine der weltweit größten Sammlungen von Seeberg-Bryozoen. Der österreichische Wissenschaftsfonds FWF unterstützt Souto-Derungs' Untersuchungen finanziell.

Die ersten Ergebnisse der Analysen liegen bereits vor. Für die Galicien Bank konnten insgesamt 24 verschiedene Arten von Moostierchen aus der Gruppe *Cheilotomata* (zu der rund 80 Prozent aller Bryozoen gehören) nachgewiesen werden. Immerhin 13 davon waren der Wissenschaft bislang nicht bekannt.

Die Artenvielfalt ist indes geringer als in vergleichbaren Habitaten am Kontinentalschelf. Haben diverse Spezies niemals den Sprung auf den Seeberg geschafft, oder finden sie dort nicht die geeigneten Lebensbedingungen vor? Dieser und weiteren Fragen will Javier Souto-Derungs in den kommenden Monaten nachgehen.



## Discovery of new inquiline association attracts media interest

Dennis Gordon

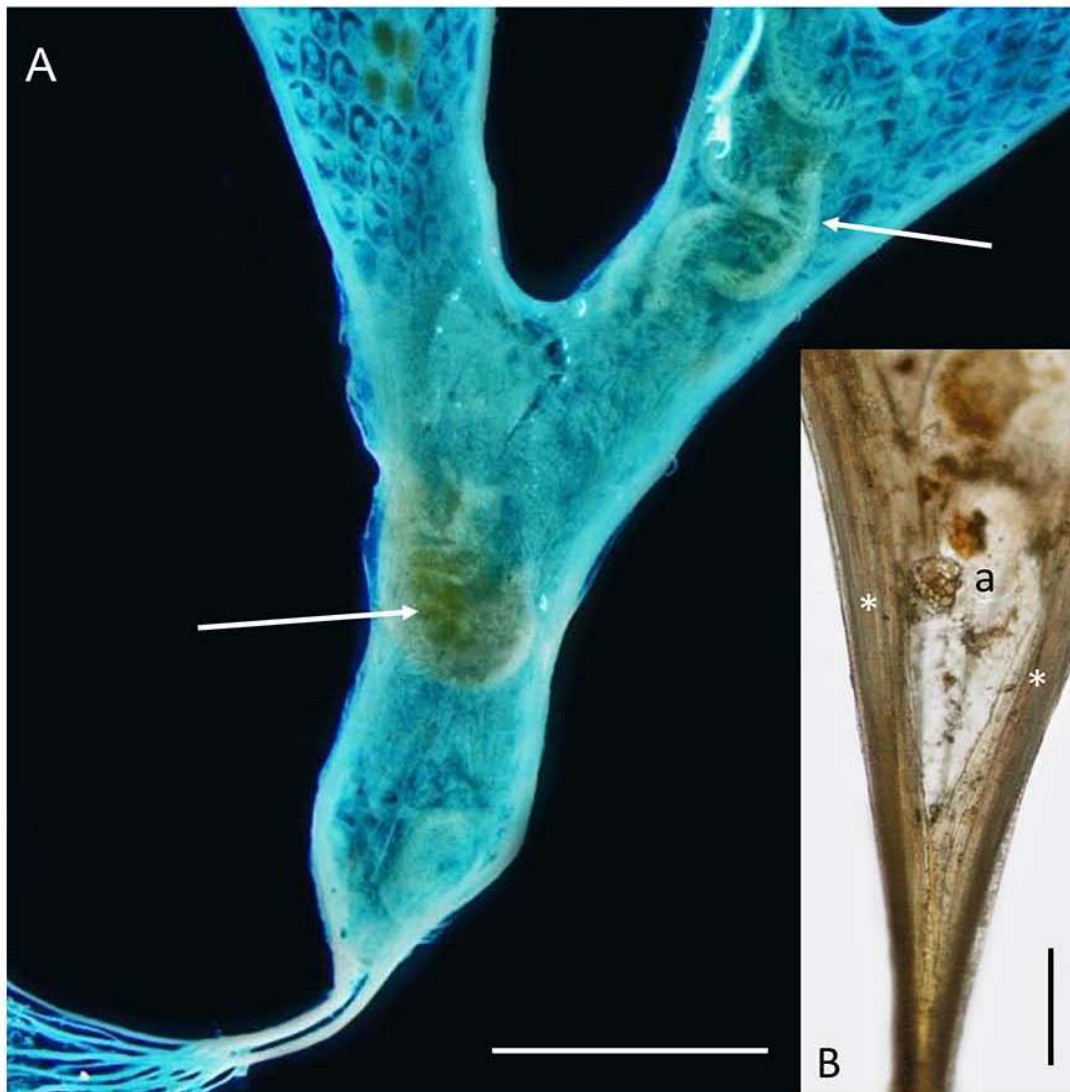
The recently published discovery of a new inquiline association involving the deep-sea New Zealand bryozoan *Onchoporoides moseleyi* and a new genus and species of photid amphipod attracted enough media interest to rate a mention in the Otago Daily Times, Dunedin.

See <http://www.odt.co.nz/news/dunedin/294344/sandhopper-family-hitches-ride-secret>

Dennis Gordon was lined up to talk about the discovery on National radio [it must have been a day when they were hard up for real news!] but he got bumped at the last minute by some more pressing breaking news. Still, it's nice to know that bryozoans can occasionally be newsworthy.

See Lorz et al (2014) in the monthly reference list.

The image below is Figure 2 from that paper (newsletter editors addition)



**Fig. 2.** A. Photograph of the abfrontal side of a colony of the bryozoan *Onchoporoides moseleyi* showing adults (middle left arrow) and juveniles (upper right arrow) of *Bryoconversor tutus* gen. et sp. nov. beneath the semitransparent abfrontal membrane. Note the paired kenozooidal rootlets and their branches at lower left; these anchor the colony to sediment grains in the soft-sediment habitat. The blue colour of the colony is optical, not staining. B. Optical photograph of the proximal end of a small colony of *Onchoporoides moseleyi* showing the ancestrular zooid (a) in abfrontal view, with calcified interiors (\*) of lateral kenozooids that converge proximally. Scale bars: A = 3 mm; B = 100 µm.

## **In Memoriam:**

### **Raisa Vasiljevna Gorjunova 1933-2014**



**An appreciation by Lena Viskova and Olga Weiss**  
(with additions by Patrick Wyse Jackson and Andrej Ernst)

Raisa Vasiljevna Gorjunova was born on 2nd July 1933 in the village Monastyrsky in the Pensa District. After finishing school in the town Bednodem'anovsk in 1957 she moved to Moscow where she worked in the department of palaeontology of the geological faculty of the Moscow State University of M.V. Lomonosov. At the same time she studied at the evening course of this faculty, and this is when she first developed an interest in the curious group of fossil animals, the Palaeozoic bryozoans. After finishing at the Moscow university in 1962 she was assigned to the Palaeontological Institute of Academy of Sciences in Moscow (PIN), where she worked until her death on 22nd January 2014. At PIN she progressed through various grades as laboratory assistant, and then junior, senior and leading scientific assistant.

At PIN Raisa Gorjunova continued her research on Palaeozoic bryozoans. Firstly, her studies were of regional importance, and included a description of the lower Kazanian *Fistuliporidae* of the Eastern-European Platform (Gorjunova 1964). Results of her study of bryozoans from the Permian deposits of Pamir and Darvaz formed the PhD thesis supervised by I.P. Morozova and defended in 1971. Later, in 1975, the majority of her dissertation was summarized in the monograph "Permian Bryozoa of Pamir". Following this period her interests diversified, and in parallel with the identification of Palaeozoic bryozoans from different regions of the former Soviet Union, Raisa Gorjunova began to consider special questions of the evolution of taxa of various levels, from genera to orders. During this work she defined and unified terminology in many groups of Palaeozoic bryozoans and suggested criteria of their classification which were used in her system of the Palaeozoic Bryozoa. Raisa Gorjunova conducted revisions of the orders *Rhabdomesida*, *Cryptostomida*, *Timanodictyida*, partly *Trepostomida*, *Fenestellida* and *Cystoporida*, and also the suborder *Palaeotubuliporina* at the species level (Gorjunova 1985, 1992, 1993, 1996, 2002, 2009, 2011; Gorjunova & Lavrentjeva 1993). In these publications details of the initial stage of bryozoan evolution, trends and development of the group from the Ordovician to the Triassic were considered. Her monograph "Phylogeny of Palaeozoic Bryozoa", published 1996, was awarded the Hans Rausing Prize.

Studying morphology and morphogenesis of separate elements of the bryozoan colonies, Raisa Gorjunova identified trends in the colonial integration of the Palaeozoic bryozoans using numerous specimens from her own field collections and from the palaeontological collections of PIN (Gorjunova 1987). She defined the effects of parallelism and convergence in many phylogenetic lineages and showed the role of zoecial polymorphism in colonial integration of bryozoans. Furthermore, she verified geochronological intervals for all higher taxa up to genus level and elaborated phylogenetic models for families, suborders and orders. These studies formed the doctoral thesis of Raisa Gorjunova, entitled "Early divergence and Palaeozoic stage of development of Bryozoa", which was defended in 1989. Later this dissertation was published as a monograph "Morphology and system of Palaeozoic Bryozoa" (Gorjunova 1992).



Raisa Gorjunova produced an enormous revision of the Carboniferous bryozoans of Eastern-European Platform. She verified the diagnoses of almost 500 genera. These results were used in the collaborative investigation on the evolution of the Palaeozoic Bryozoa of the Class Stenolaemata (Gorjunova, Markov & Naimark, 2004). In the development of bryozoans, evolutionary phases were identified, inadapative and evadaptive groups of bryozoans were defined and their biogeography was reconstructed. The authors showed that in the Early Ordovician, bryozoans were in the phase of extensive diversification, and in the Late Ordovician, Phylloporinida, Cryptostomida, Rhabdomesida and some groups of other orders, experienced their acme. The global crisis at the end of Ordovician led to the extinction of all dominant groups. Beginning from the Silurian, Fenestellida became a dominant order. The late Devonian ecological crisis did not affect bryozoan evolution significantly. The Late Carboniferous and Permian saw several blooms and blasts of diversification of Fenestellida, Rhabdomesida and Hexagonellina. Towards the end of the Palaeozoic the extinction was bryozoans was gradual. The most dramatic moment in bryozoan evolution occurred at the Permian-Triassic crisis: at the end of the Permian almost all Palaeozoic orders disappeared.

Raisa Gorjunova developed a special interest in the modular theory of evolution, and using the example of Rhabdomesina she attempted to show the importance of the modular organisation, its origination and sophistication during the historical development of this order (Gorjunova 1999). Raisa Gorjunova outlined the role of bryozoans in the building of reefs and other organic buildups of the Palaeozoic (Gorjunova 1997, 2001), and the adaptations of growth habits in Ordovician bryozoans (Gorjunova 2009). She participated in collaborative topics devoted to ecosystem problems, crises and biodiversification. She contributed to the long-term study of the Palaeozoic bryozoans of Mongolia (Morozova, Gorjunova and Ariunchimeg 2003).



*Bryozoologists at PIN: Left photograph: Ernie Gilmour, Lena Viskova, Iraida Morozova, Raisa Gorjunova, Ed Snyder (photo by Catherine Reid). Right photograph: Lena Viskova, Caroline Buttler, Patrick Wyse Jackson, Raisa Gorjunova (photo by Dmitrii Lisitsyn).*

R.V. Gorjunova was the regular secretary of the Commission on Bryozoa of the Problem Council of PIN, which arranged colloquiums and conferences on Recent and fossil Bryozoa (all-Russian, international) together with other organizations once every 3-4 years (from 1967 to 2003). In the early 1980s Raisa Gorjunova became secretary of the editorial council of the Institute and actively assisted its chair, Dr L.A. Neveeskaja in the course of preparation of monographs for publication. She generously shared her time and expertise in providing consultations on Palaeozoic bryozoans equally with young researchers as well as with local and international colleagues (including Ernie Gilmour, Ed Snyder, Catherine Reid, Caroline Buttler, Patrick Wyse Jackson and Andrej Ernst). One example can be seen in the doctoral thesis on Palaeozoic bryozoans by I. Ariunchimeg (scientific officer of the Mongolian Academy of Sciences), whose successful defence was held at PIN. R.V. Gorjunova was a long-term member of the International Bryozoology Association and contributed a paper to the 1974 proceedings (Gorjunova 1975); unfortunately together with a number of her colleagues she was unable to attend the Lyon meeting.

Raisa Gorjunova loved her work, she was endlessly devoted to the science. Despite her difficult health condition in the last years, she managed to finish a series of publications with assistance of her colleagues. Three of them were submitted for publication in the Paleontological Journal: “On revision of Diploporariinae (Bryozoa) from the Lower Carboniferous of the Eastern-European Platform”, “On revision of the genus *Fenestella* (Bryozoa) from the Lower Carboniferous of the Eastern-European Platform”, both by Gorjunova, and “Genus *Laxifenestella* from the Lower Carboniferous of the Eastern-European Platform”, by Gorjunova and Weis. The manuscript “History of the study of the Palaeozoic bryozoans in Russia”, by Gorjunova and Weis, was submitted for publication in the Bulletin of the Moscow Society of Naturalists (MOIP). R.V. Gorjunova was author of more than 100 scientific publications, from them 14 monographs. She established more than 40 genera and defined a series of new families and subfamilies of Palaeozoic bryozoans. In her honour *Goryunovia* Taylor & Rozhnov, 1996, a cyclostome genus from the Ordovician of Russia, and *Raissiella* Popeko, 2000 were erected.



*Raisa Gorjunova at her home in Moscow, October 2010 (photography by Andrej Ernst)*

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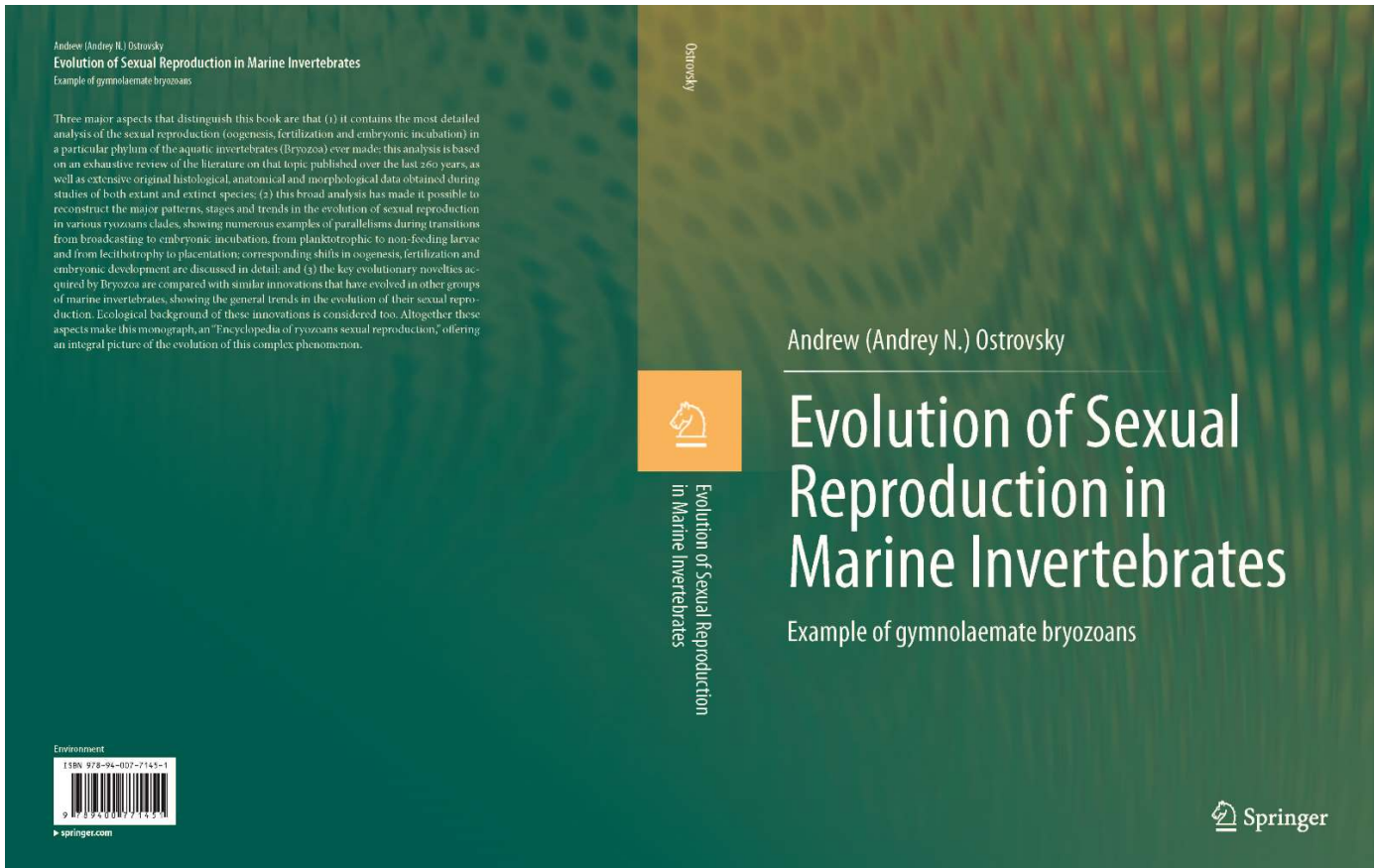
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# Bryozoan Books



This book includes:

- Comparative analysis of reproductive patterns in Bryozoa
- Structural diversity, independent origin, brood chamber evolution in different cheilostome groups
- Analyses main directions in bryozoans sexual reproduction evolution
- Emerging trends of these are compared with analogues in evolution of bryozoan order Ctenostomata and other marine invertebrate groups
- Reconstruction of stages of sexual reproduction evolution in other bryozoan groups
- History reviews of study of sexual reproduction in the Gymnolaemata with list of species studied

Three major aspects that distinguish this book are that (1) it contains the most detailed analysis of the sexual reproduction (oogenesis, fertilization and embryonic incubation) in a particular phylum of the aquatic invertebrates (Bryozoa) ever made; this analysis is based on an exhaustive review of the literature on that topic published over the last 260 years, as well as extensive original histological, anatomical and morphological data obtained during studies of both extant and extinct species; (2) this broad analysis has made it possible to reconstruct the major patterns, stages and trends in the evolution of sexual reproduction in various bryozoan clades, showing numerous examples of parallelisms during transitions from broadcasting to embryonic incubation, from planktotrophic to non-feeding larvae and from lecithotrophy to placentation; corresponding shifts in oogenesis, fertilization and embryonic development are discussed in detail; and (3) the key evolutionary novelties acquired by Bryozoa are compared with similar innovations that have evolved in other groups of marine invertebrates, showing the general trends in the evolution of their sexual reproduction. Ecological background of these innovations is considered too. Altogether these aspects make the monograph an “Encyclopedia of bryozoan sexual reproduction,” offering an integral picture of the evolution of this complex phenomenon.

The book can be accessed at <http://www.springer.com/life+sciences/ecology/book/978-94-007-7145-1> and <http://link.springer.com/book/10.1007%2F978-94-007-7146-8>

If you have difficulty contact Andrew Ostrovsky directly at [aan\\_univer@yahoo.com](mailto:aan_univer@yahoo.com)



# Meetings and Conferences

## Bryozoology

Larwood Symposium - Sopot, Poland 12-13 of June 2014. The deadline for registration and abstract submission is the end of April. See [www.iopan.gda.pl/projects/Larwood/](http://www.iopan.gda.pl/projects/Larwood/) for details.

*Piotr Kuklinski*

## Paleontology

7th International Meeting on Taphonomy and Fossilization

Ferrara, Italy, 10 - 13 September 2014

<http://web.fe.infn.it/taphos2014/>

4th International Palaeontological Congress (IPC 2014)

Centro Científico Tecnológico, Mendoza, Argentina, 28 September - 3 October 2014

Radiation and Extinction - Investigating Clade Dynamics in Deep Time

Linnean Society of London, Burlington House, Piccadilly, London, UK 10 - 11 November 2014

<http://www.linnean.org/Meetings-and-Events/Events/Radiation+and+Extinction+-+Investigating+Clade+Dynamics+in+Deep+Time.>

Geological Society of America Annual Meeting

19-22 October, Vancouver, BC, Canada

<http://community.geosociety.org/gsa2014/home/>

## Biology

ICMBE 2015 : International Conference on Marine Biology and Ecology

Dubai, UAE. January 30 - 31, 2015

<http://www.waset.org/conference/2015/01/dubai/ICMBE>

49th European Marine Biology Symposium (8-12 September 2014, Saint-Petersburg, Russia)

<http://www.imber.info/index.php/Meetings/IMBER-Relevant-Meetings/meetings-2014/September-2014/49th-European-Marine-Biology-Symposium-8-12-September-2014-Saint-Petersburg-Russia>



## Recent Publications

The following list includes works either published since the previous issue of the *IBA Bulletin* or else missed by previous issues, or sometimes repeated due to inattention by the Editor. As always, members are encouraged to support future compilations by continuing to send complete citations to the IBA secretary at any time. Reprints will be gratefully received by the IBA archivist, Mary Spencer Jones.

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